WHIRRAKEE

October 2006 Vol. 27 No. 9

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MONTHLY NEWSLETTER OF THE BENDIGO FIELD NATURALISTS CLUB

Bendigo Field Naturalists Club Inc.
Address for correspondence: PO Box 396, Bendigo 3552
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Office Bearers for 2006 - 2007

President	Glenise Moors	Mandurang South Road, Sedgwick	54396254
Senior Vice President	Richard Goonan		0423418815
Junior Vice President	Anne Bridley		5449 3479.
Secretary	Anne Bridley		5449 3479.
Minute Secretary	Peter Ellis		
Treasurer	Stuart Fraser	12 Bambara Close, Bendigo	
Membership Officer	Kate Lottkowitz	80 Piccaninny Rd, RSD Strathfieldsaye	5439 3157
Excursion organiser	Richard Goonan		0423418815
Syllabus organiser	Rod Orr	2 Cockerel Court, Bendigo	5443 5668
	(an assistant's position for the syllabus organiser is still vacant)		
Librarian	Diana Collier	31 Milroy Street, Bendigo	5443 0137
Garden Convenor/Secretary	Matthew Comer	46 Railway Place, Goornong	5432 2380
Hall Management	Maurie Lewis and Darren White		0407 427179
Whirrakee contact	Sabine Wilkens	82 Somerville Street, Bendigo e-mail: s.wilkens@latrobe.edu.au	5443 2797

Membership of the Bendigo Field Naturalists Club is open to all those interested in Natural History. The subscription rates are: Single $34; Family $40; Concession: Single $28.50; Family $34. *Whirrakee* subscription only is $34.

General meetings are held on the second Wednesday of each month. The venue for General meetings is the Golden Square Senior Citizens Building, Old High Street, Golden Square. The invited speaker at general meetings starts at 8:00pm and meetings conclude with supper.
If a workshop is held prior to the meeting, it will be advertised and it usually starts at 7.00pm.
The Annual Meeting is held in September.

Committee meetings are held on the third Wednesday of each month at 7:30pm. Members of the Committee are the Office Bearer listed above and the following members: Matthew Comer, Bill Holsworth, Darren White, Bob Ruddick, Rod Orr, Jan Orr, Peter Ellis, Ben Goonan, Richard Goonan, Anthony Sheean, Liz Graham

Excursions are conducted regularly and are advertised on the diary page of the *Whirrakee*. The assembly point for excursions is the Golden Square Senior Citizens Building, unless otherwise specified. In addition to local excursions, campouts are held several times each year, usually coinciding with long weekends or holiday periods.

The Bendigo Field Naturalists Club has one active group that meets regularly (the Fauna Study Group) and other groups that meet at irregular intervals.

Fauna Study Group: meets on the fourth Wednesday of the month at 7:30pm in the Golden Square Senior Citizens Building.
Chairman: John Burtonclay, Fadersons Lane, Mandurang (5439 5710)
Secretary: Bill Holsworth, 13 Nabilla Crs., Bendigo (5443 4063)
Equipment Officer: Maurie Lewis (0407 427179)

Bird Observers Group: This group has field excursions and the occasional lecture evening. Please consult the *Whirrakee* for details. Special bird observations should be reported to Anne Bridley 5449 3479.
To propose meetings or excursions please contact Kerrie Norris 5447 8017.

Front cover photo?...see page 2.

WHIRRAKEE

Monthly Newsletter of the Bendigo Field Naturalist Club

Vol. 27, No. 9, October 2006

Whirrakee takes its name from the Whirrakee Wattle (*Acacia williamsonii*) which is virtually endemic to the Bendigo region

CONTENT

Item	Contributor	Page
Short Notices including October excursion		3
Annual General Meeting and September General Meeting: Notes and Observations	Jan Orr	3
Annual General Meeting, Speaker: Magali Wright 'The use of mycorrhiza in the propagation of *Caladenia* species'	Sabine Wilkens/Magali Wright	5
Greetings from the far north	Darren Green	8
Subscription form for 2006/2007 BFNC membership		9

Authors are responsible for the accuracy of the information they use and also for any opinions expressed in their articles. Contributions will be included as soon as possible after they are received, although articles received more than one week after the monthly General Meeting will probably be too late for inclusion in the next issue of *Whirrakee*.
Articles in *Whirrakee* may be reproduced, but permission should be obtained from the Bendigo Field Naturalists Club, and acknowledgment should be given to the author and the Club. Some back issues are still available on request.

Editor's Note:
The Annual General Meeting has come and gone. Thank you to all the outgoing, as well as the new and renewed office bearers and committee members, for volunteering time and enthusiasm to the club. Anybody else out there, who wants to get involved (a little or a lot) is most welcome. There are many areas where members' time, initiative and skills are needed. Why not attend the next meeting?

Front Page Illustration: John Wolseley, *Scrambling, Climbing, Flying and Moving through the Cobboboonee Forest* (detail), 2006. Watercolour, carbonised wood, graphite on 16 sheets of paper, each approx. 56 x 76 cm. Total size of work, 225 x 306 cm. Courtesy of the artist and Roslyn Oxley9 Gallery, Sydney. Photo: Andrew Barcham, Screaming Pixel.
This painting is part of the exhibition '*A Bird in the Hand:* Paintings by Tony Clark and John Wolseley', 30th September – 29 October at the LaTrobe University Visual Arts Centre Gallery, 121 View Street, Bendigo. Opening hours: Thursday – Sunday 11am – 5pm. Tel: 54418724.

Short Notices

October Excursion
with Richard Goonan

The October Excursion is to the Barmah Forest to look at the indigenous culture, birds, plants and the Murray and possibly some wetlands.
Saturday, October 14 depart 7am
return approx 5pm
For further information call: 0423418815
And...bring your sunscreen, lunch and warm clothes... and your swimmers and towel, if you are brave enough.

A Weekend of Botanical Drawing

This weekend workshop is being repeated due to strong demand. It will run on Saturday 21st October (9am – 5pm) and continues on Sunday 22nd October for the morning (9am -12noon).
The cost is $ 50.- for members of the 'Friends of the Botanic Gardens' and $ 60.- for non-members.
The leader is Jean Dennis, a highly acclaimed botanical artist.
There are only a few places available, so please indicate your interest a.s.a.p. by ringing Annie Clark on 54421615 to get a material sheet, or, alternatively, ring Rod Orr on 54435668.

Supplement to Native Trees and Shrubs of South-Eastern Australia by Leon Costermans.

This is available on CD-ROM and will bring you up to date with the hundreds of name changes and newly described species since the book was published in 1981.
It is available for $25 from the VNPA ($21.50 VNPA members).

For order form, contact Anne Bridley (544 94379) or the VNPA (93475188)

SEANA campout March 2007

hosted by Geelong Field Naturalists Club
location: Forrest, in the central Otways.

Booking must be early:
A $30 deposit/participant is now due. Make cheques payable to SEANA Inc Autumn 2007 campout, post to ER Southcombe, 4 Peary St, Belmont 3216.

Fire Operations Plan
For those interested in the new fire operations plan, it is available for viewing at the Epsom DSE office. A club submission is being put together...contact Rod Orr for details where it is up to.

Bendigo Field Naturalists' Club Annual Meeting 12.9.2006

Chair Jane Cleary

Minutes of the previous Annual Meeting were read and approved.
Motion, Maurie Lewis Seconded, Anne Bridley Carried

All positions were declared vacant and nominations were called for:
President, Glenise Moors Nominated by Bill Holsworth. Carried
Vice President, Richard Goonan Nominated by Rob Moors. Carried
Junior Vice President, Anne Bridley Nominated by Jan Orr. Carried
Secretary, Anne Bridley Nominated by Glenise Moors. Carried
Treasurer, Stuart Fraser Nominated by Rod Orr. Carried

Committee
Matthew Comer, Bill Holsworth, Darren White, Bob Ruddick, Rod Orr, Jan Orr, Peter Ellis, Ben Goonan, Richard Goonan, Anthony Sheean, Liz Graham.

Appointed Positions
Whirrakee Editor, Sabine Wilkens
Syllabus Co-ordinator, Rod Orr
Hall Managers, Maurie Lewis and Darren White
Membership Officer, Kate Lottkowitz
Librarian, Diana Collier
Garden Organiser, Matthew Comer
Minute Secretary, Peter Ellis
Excursions Officer

President's Report by Matthew Comer
Matthew thanked all the office bearers and members who accepted extra duties, for their work in making the past 12 months such a successful year for the club. He specifically mentioned and thanked Richard Goonan for organising the monthly excursions, Rod Orr for planning such an interesting list of speakers for the year and for all the helpers who came along to the monthly garden working bees.
Matthew will publish his report in the *Whirrakee*.

Treasurers Report by Stuart Fraser
The DSE weeds removal grant money has not been all spent but the DSE have given the remainder of the grant to the club. $10000 from the Publications Account has been placed in a fixed interest account.
The report will be published in the October *Whirrakee*
(N.B. this is now held over till November)
That the Treasurers Report be accepted
Moved Stuart Fraser Seconded Jane Cleary.
Carried

Jane Cleary thanked Matthew Comer on behalf of the BFNC for all his work for the club during the past 3 years as President. She remarked on Matthew's unwavering interest in natural history and his commitment to conservation throughout his long association with the BFNC. The club recognises and greatly appreciates his contribution.

The Annual Meeting concluded at 9:30pm

P.S.
Members are reminded that subscriptions were due on September 1, 2006.
Subscription rates are shown on the inside front cover of *Whirrakee* (they include GST). Please send the correct amount to:
The Treasurer, Bendigo Field Naturalists' Club Inc. PO Box 396, Bendigo, Vic. 3552.

Notes and Observations from the General Meeting held on 12.9.2006
Glenise Moors
1.1 Caterpillars are eating the Cyprus Daisy in her garden, it appears to be very much like the caterpillar that eats the Cape-broom. She showed the meeting a specimen for the members to help her identify.
1.2 She brought specimens of the hardy local native plant species that are flowering now in her garden.
- *Phebalium* (not eaten by wallabies)
- Ausfeld's wattle
- Scarlet Mint-bush
- 'Sedgwick Grevillea' she has grown from cuttings taken from plants that used to be common in the water reserve.
- *Pterostylis curta* (one of Tom Patullo's plants he gave her some years ago)
1.3 Approximately 18 months ago she dug up several *Thelymitra* on her property when they were threatened by Telecom. She has as yet, been unable to plant them back in the bush hence, they are still in pots. 16 will flower this year.

Jane Cleary
2. She visited the Bendigo Waste Water Treatment Plant last weekend and saw many White-backed Swallows. They are usually seen there. However she was delighted to see two White-backed Swallows flying over the section of the Bendigo Creek near her house in Epsom. She has not seen them there in a long time.

Jan Orr
3. The cut mallee area of Skylark Rd, in the Whipstick section of the Greater Bendigo

National Park, is very busy with honeyeaters at the moment. She saw White-eared, Yellow-plumed, Yellow-faced, Yellow-tufted, White-fronted, Brown-headed, Tawny-crowned and Red Wattlebirds. Also many other birds were in full 'spring voice'. Prominent among them were Rufous Whistlers, Common Bronze-wings, Superb Fairy-wrens and Horsfields Bronze-cuckoos.

Rod Orr
4. He showed the meeting a sample of mallee leaves with buds, flowers and fruit that he picked from a tree that had been puzzling him for many years. He had never seen it flowering before. It was growing in and around the cut mallee in Skylark Rd. and has similar bright green leaves to the *E. viridis* that was harvested for the production of eucalyptus oil. However it has much longer leaves, hardly any eucalyptus scent when crushed, bright red stems and larger flowers. Is it a hybrid or is it a variety of Green Mallee or is it a different species?

Anne Bridley
5.1 She reported that she and Glenise Moors witnessed a Willy Wagtail give a most unusual display last week. It occurred up on the Sedgwick hills Flame Robin site. A Willy Wagtail was on a rock and a second Willy Wagtail flew down and joined it. The second bird then lowered its body to a horizontal position and tucked his beak down onto its chest, thus bringing the top of his head forward. As it did this it raised and extended its white eyebrows until they looked like white head lamps. The first Willy Wagtail then flew off. Anne was unable to establish the sex of the birds as the whole display was so brief.
5.2 She recently went walking in the Millwood Dam/Campbell's dam area of the Greater Bendigo National Park. She recorded a similar bird list to the one Jan Orr made at Skylark Rd.
This area is well worth a visit as well.

September Annual Meeting: Speaker Magali Wright:
'The use of mycorrhiza in the propagation of *Caladenia* species'

by Sabine Wilkens with the help of Rod Orr and Magali's power point slides

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Like most projects in ecology, many people with different interests and expertise are involved. At the beginning of her talk, Magali acknowledged, as co-authors, her supervisors Rob Cross, Prof. Roger Cousens and Dr. Cassandra McLean.

This talk was to contain the following points (however, not having attended it myself, some of the sections are dealt with rather briefly, for these I have drawn on Rod Orr who was there on the night:

- Introduction: orchid mycorrhiza
- PhD project summary
- Some methods & results: harvesting and selecting mycorrhizal isolates
- *Ex situ* propagation at the RBG
- *Caladenia audassi* and *C.* sp. aff. *fragrantissima*

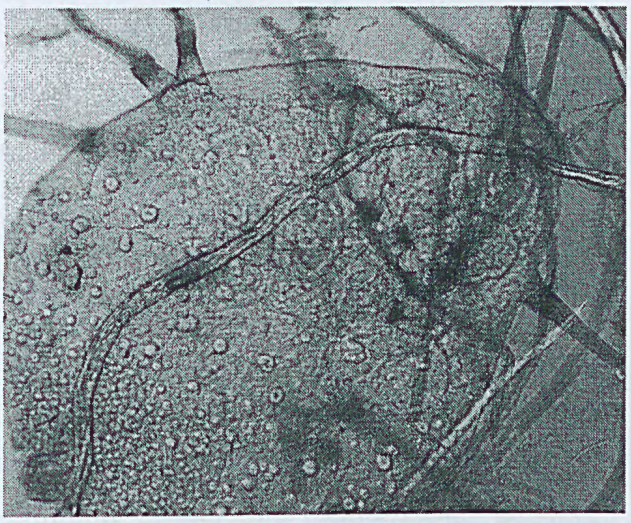
Orchids and their Mycorrhiza
The term 'Mycorrhiza' means 'fungus-root' This represents a symbiotic, and in most cases a mutualistic (both partners benefit), association between certain soil fungi and the roots of plants.
The benefit for the fungus is that it has access to sugars from plant photosynthesis, while the plant benefits by having increased access to water and soil nutrients (P, K and in some cases N and C).

Mycorrhizal associations are extremely common and plants that don't have them are the exception rather than the rule. The difference with orchids is that these plants need the fungal partner right from the moment of germination, as orchid seeds are

absolutely tiny, with no nutrient reserves supplied by the parent plant whatever.

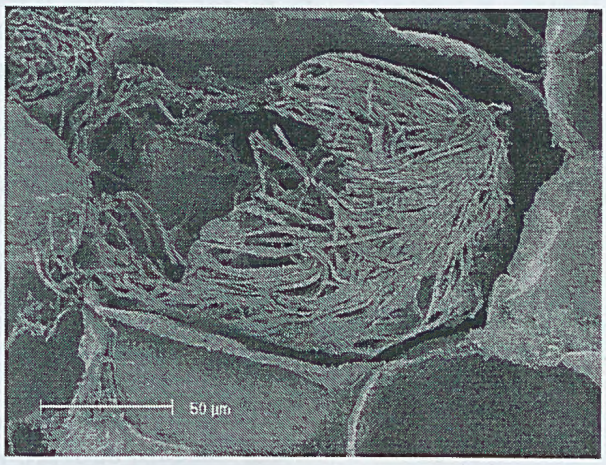
Most other plants can live for a fair time, while their endosperm or fleshy cotyledons supply them with the minerals and carbohydrates they need, until they get established and start absorbing sufficient minerals and photosynthesising effectively. This is not so with orchid seeds. If they land on a suitable substrate and they don't find a suitable fungal partner straight away, the seed is doomed.

All members of the family Orchidaceae form mycorrhizal associations, with the majority of the fungal partners coming from the non-sporulating Basidiomycetes (genus *Rhizoctonia)*
An infection of the orchid seed with these fungi is thus essential for orchid seed germination in nature (mycotrophic stage).



The micrograph above shows an orchid seed infected with a mycorrhizal fungus. The large cells in the top right of the seed contain 'pelotons', masses of fungal hyphae. Within these cells is where the exchange of nutrients between the orchid and the fungal partner occurs.
On the bottom left of the seed is the seedling's growth ti,p or meristem.

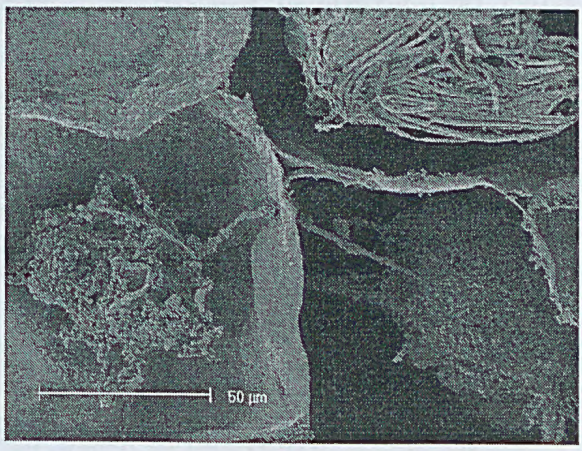
(Photo taken by M.Wright 2001)



This scanning electron micrograph shows a single 'peloton' within the orchid seed cell. The mass of fungal hyphae dominate the plant cell content. The cell's nucleus is visible on the left.
(Picture taken by M.Wright 2001)

The process of the orchid seed meeting its future fungus is fraught with danger for both partners. The fungus can live a life of a saprophyte and digest the seed, while the plant cell can also react against the foreign invader and digest the fungus.

The micrograph below shows a healthy peloton on the top right, while the one on the left has been digested.
(Picture taken by M.Wright 2001)



Magali's PhD Project Summary
Magali's project is concerned with maximising the activity of mycorrhiza that form associations with certain rare orchids in Victoria. This increased activity can

then lead to better success in cultivating these orchids and better success rates when re-establishing them in their natural habitat.

Manipulating the growth environment of the fungus or its habitat in the wild is one way of maximising its activity. Others include selecting certain sites and selecting certain genotypes of fungus to maximise the association with the orchids.

A sound and sustainable method of harvesting and isolating the fungus from its orchid partner in the wild, for study and cultivation, is vital in this process and this is what Magali has concentrated on.

She is using several species of *Caladenia,* as her model, from six different study sites in Victoria: Maldon, Chewton, Eltham,, Inverleigh, Anglesea and Wonthaggi.

Some Methods and Results

After the study sites were selected, they were characterised by identifying the soil type and the major nutrient levels. It was interesting to note that the Inverleigh site had rather low Carbon, N, P and K while Wonthaggi had much higher levels of these compared to the other sites.

One important result presented was the effect of mycorrhizal harvesting on plant survival and reproduction

•Magali used the so-called 'slice method' to harvest infected orchid tissue, in preference to removing the collar, which is more likely to damage the orchid (the collar is the region of the stem just below the soil surface).

Several different methods were tried to get clean, uncontaminated fungal isolates, including surface sterilisation of tissue, use of antibiotics in isolation media or a combination of these measures. Of the various combinations, only surface sterilisation and antibiotic media resulted in 100% uncontaminated recovery of the fungus.

After sampling from the plants in the wild at different seasons, their success in re-emerging the following season as well as their seed viability was observed.

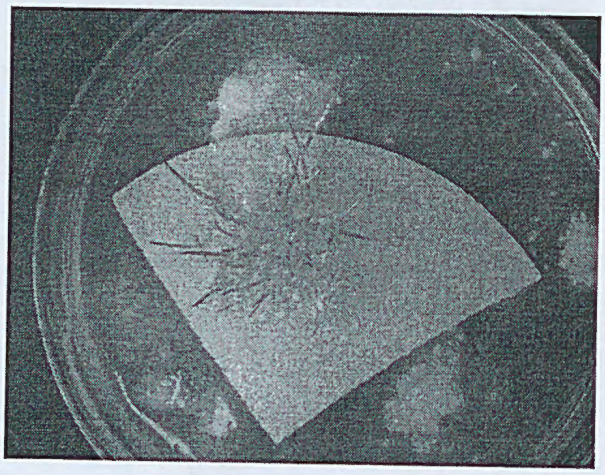
As Magali did not sample large numbers of orchids in the wild, her numbers of re-emerging plants are small. Plant survival of the 'slice method' of sampling was generally good, especially if harvesting was done in October. Success of re-emergence was varied though, but so was the re-emergence of untreated, control plants. Seed viability in this re-emerging population was also not obviously affected by the sampling

Cultivation involves the removal of mycotrophic tissue from the plant and subsequent subdivision and culturing of tissue pieces under sterile conditions. Once a fungal colony had emerged, agar blocks containing individual colonies were isolated and grown in separate petri dishes.

Once several isolates were obtained, their identify was determined using gene sequencing techniques. It turned out that six isolates belong to the *Sebacina vermifera* complex (two different groups) and that the isolate from Maldon belonged to a separate species.

Next, Magali tested how specific the relationship between orchid seeds and fungal isolates was.

Perhaps surprisingly, specificity varied, some isolates from one site produced good rates of germination with the locally collected seeds, but some did not.



The photograph below shows successfully germinating orchid seedlings in the presence of their fungus.

To optimise this growth phase further, Magali also tested which particular carbon and nitrogen sources caused optimum development.

What do we know so far?

• An isolate from the same site as the seed may not be the best for symbiotic propagation

• Isolates differ in their ability to use different carbon and nitrogen sources

• It is possible that there is a variation in these functional abilities within each population

• If so, how many plants do we need to harvest from to get an appropriate fungus for symbiotic propagation?

To work further on the problems of mycorrhizal diversity, Magali isolated more fungi in 2005. Six plants were sampled from each of the six sites, and six fungal isolates selected from each plant (that's a lot of work...)

216 isolates were obtained in total, of which 27 were *Rhizoctonia* morphological types (assumed to be different taxa). These latter were categorized, according to various morphological attributes in culture.

Some isolates were distinct between the six sampling sites, but some were shared amongst several of the sites.
Some sites were more diverse with respect to *Rhizoctonia* types than others. Magali found that the amount of carbon in the soil correlated best with mycorrhizal diversity.

Further work going on at the Royal Botanic Gardens

•Store seed

•Isolate fungi

•Germinate seed

•Store fungi

•Grow seedling in flasks

•Transfer into nursery

Work done with the two model species:
(Note that these 2 species of spider orchid are rare, locally occurring orchids, so there are important local applications of Magali's work to their survival)

Caladenia audassi

–Whole collar isolation

–Three isolates tested

–Over 10 isolates in long term storage

–Fungal isolates give 10-20% seed germination

–40 plants have been deflasked into nursery

–15 plants in tissue culture tubes

Caladenia* sp. aff. *fragrantissima

–Tissue slice isolation

–Three isolates tested for seed germination ability

–12 isolates in long term storage

–All show less than 10% germination

–Six plants have been deflasked into the nursery

–30 plants in tissue culture tubes

What next?

•Grow fungal isolates on millet and use millet in germination tests

•Test seed viability?

•Re isolate new fungi?

Although (very regretfully) I was not there for the talk, I found the power point slides provided by Magali fantastically interesting. What a great project! I hope I have done her message justice by guessing a bit between the lines what she said on the night. Thanks also to Rod Orr (who was there on the night) for looking over my write-up. Rod said that Magali's talk was very well received by the members at the AGM and led to many interesting

comments and questions. Here is another question from me…

This photograph by Magali shows the seeds of orchids. No scale bar is given but they are tiny, like specks of dust. Each capsule contains thousands of seeds and they are dispersed by the wind. Orchids are a highly evolved and successful plant group. Their pollination is usually achieved by animals, which carry a whole parcel of pollen grains (the pollinium) to the receptive stigma (rather than individual pollen grains or few grains attached to each other, like in most other groups of plants).

This means that fertilization occurs simultaneously for the thousands of ovules present in the orchid ovary. Is this the reason why the parent plant cannot/does not supply the developing seeds with nutrients for their start in life, which, in turn, makes them so dependent on these mycorrhizal fungi for germination? Does anybody know?

Magali acknowledged the following people:
•her supervisors: Cas, Rob and Roger
•DSE and AOF for funding
•Burnley Nursery Staff: Alex, Nick and Jeremy
•DSE Staff: Geoff Nevill, Andrew Pritchard, Rani Hunt, Karen Lester
•Parks Vic Staff: Gary French, Cam Bearsall
•ANOS: Dick Thomson and Malcolm Thomas
•Inverleigh Friends Group: Neil Atherton and Steve Murphy
•Wonthaggi Heathland Friends Group: Terri Allen
•Fellow Fungi Nuts: Zoe Smith, Sascha Andraski and Noushka Reiter

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Special Book Offer to Members
'Leaf Litter' by Rachel Tonkin

Editor's note:
Through the help of Frances Cincotta, Bill Holsworth was able to get a copy of this new book to the August general meeting where it received much admiration.
As a result, Bill has ordered a number of copies to sell to members at the special price of 25 dollars. Please let Bill know if you are interested in purchasing a copy.
Some information about the book and the author was supplied in the September *Whirrakee*.

Greetings from the far north

Bendigo sometimes feels very plain, in comparison…

Do you know one of these men?

This photo has been sent in by Darren Green and Jo Carnsew and shows Darren with work colleagues (published with his permission).
He now works at Tjapukai Aboriginal cultural park, Cairns, where he sells photos of the dancers with tourists. You might remember that Darren was doing the same thing at Cairns Tropical Zoo and Hartley's Crocodile Adventures, except with animals (koalas, snakes & crocodiles).. He writes that the job and the people are a very interesting and that they are learning a lot about the Tjapukai culture. Learning to play the didgeridoo will be the next step…

…and all this, while he is completing his studies at Latrobe University, Bendigo.

Diary

The General, Bird Observers Group and Fauna Study Group meetings are held at the Golden Square Senior Citizens Building, Old High Street, Golden Square, unless otherwise indicated.

General Meetings
Wednesday, October 11 7.30pm
Frances Cincotta will run a combined talk/workshop about identifying native peas.

Excursions
The October Excursion is to the Barmah Forest to look at the indigenous culture, birds, plants and the Murray and possibly some wetlands.
Saturday, October 14 depart 7am
return approx 5pm
For further information call: 0423418815
And…bring your sunscreen, lunch and warm clothes… and your swimmers and towel, if you are brave enough.

Fauna Group
This group meets (in the clubrooms) on the fourth Wednesday of the month at 7.30pm.

Wednesday, October 25 7.30pm
Glenise Moors will discuss ***Birds and why it is so!*** For example, What is the practical function of birds plumage and other distinguishing features?
All welcome

Fauna Excursions
Every Friday morning starting at around 9 to 9:30, the Fauna Group inspects nest boxes in the Spring Gully area. The excursions are led by Maurie Lewis, 16 Vains St. Golden Square. Phone 0407 427 179 or 5442 1813. Phone Maurie to confirm exact departure times and location. If you don't phone but go directly to Maurie's house and find nobody at the house between 9 and 9:30 then the excursion is not on.

Wildlife Rescue & Information Network Inc.
W.R.I.N. is an organisation dedicated to the care of orphaned, sick or injured native animals. It is fully endorsed by the Dept of Sustainability and Environment.
Please call our Emergency Number for Help for Fauna in Need. Phone: 0419 356433.

WRIN Annual Garage Sale
Saturday 28th October
Where: 127 Havlin Street East
The sale will commence at 8am, please come and support them.

South East Australian Naturalists Association Spring Camp
13th-15th October.
Hosted by Maryborough Field Naturalists Club.
Registration by 30 August.
Further information, Eileen Courtney ph 54612249 Brian Johns 54612755.

Advance Notice:
SEANA campout March 2007
hosted by Geelong Field Naturalists Club
location: Forrest, in the central Otways.
Booking must be early:
A $30 deposit/participant is now due. Make cheques payable to SEANA Inc Autumn 2007 campout, post to ER Southcombe, 4 Peary St, Belmont 3216.

New Edition of Box Ironbark CD
The new edition of 'Plants and Animals of the Box-Ironbark Area of Central Victoria' is still available at the usual price of $ 50.

…and **Wildlife of the Box Ironbark Country by Chris Tzaros** is also still available at $ 30.-.
Please contact Bill Holsworth if you are interested in purchasing one of these.

Bendigo Field Naturalists on the web
Any comments about the site are most welcome
http://communitysites.impulse.net.au/bendigofieldnaturalists/fnats.html

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